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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,056	01/22/2002	Kyoichiro Asayama	843.41106X00	1783

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EXAMINER

PERT, EVAN T

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/051,056	Applicant(s) ASAYAMA ET AL.	
	Examiner Evan Pert	Art Unit 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-53 is/are pending in the application.
- 4a) Of the above claim(s) 33-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31,32 and 36-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0102</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group III, Species IIIA is acknowledged. Note that "IIIB" appears as a typographical error in the paper filed 8-26-03 at paragraph 5 at p. 12, which should read "IIIA". Claims 31, 32 and 36-53 are pending for consideration while claims 33-35 are withdrawn from consideration as being drawn to a non-elected species, there being no allowable generic or linking claim.

Claim Objections

2. Claim 31 is objected to for the typo "them" in the last line that should read --then--. Appropriate correction is required.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 50-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is no antecedent basis for "said TEG" in the last line of claim 50.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (U.S. 6,159,826).

Regarding claim 31, Kim et al. disclose a method for manufacturing a semiconductor device comprising forming 1st electrode pads (56b) comprised of an uppermost wiring layer (56) in a scribe region (34) and a bonding pad (56a) comprised of the uppermost wiring in a product circuit region (32); forming a protection film (57) on an upper layer of said uppermost layer wiring (56); and partially exposing a surface of said bonding pad by removing a predetermined part of said protection film (i.e. openings selectively formed at 56a and 56b).

Regarding claim 32, Kim et al. disclose forming second electrode pads and comprised of said uppermost layer wiring (56) and the partially exposing step of the 1st pad includes partially exposing a surface of the second pad (i.e. both opening are formed to expose pads in and out of the scribe region).

Kim et al. are silent about dimensions of the electrode probing and bonding pads provided in their invention. Yet, the examiner takes Official Notice that a plethora of references are available that disclose the advantageous trend of miniaturization in semiconductor devices, including shrinking pad sizes.

Furthermore, the courts have ruled that a size limitation is not novel over the prior art unless an unexpected result is achieved **[MPEP 2144.04, Section IV A]**.

In the instant case, applicant recites dimensions that include pad sizes generally smaller than discussed in the prior art, but fails to recite any unexpected result of the particularly claimed sizes

It would have been obvious to one of ordinary skill in the art to choose pad sizes in the scribe and product regions as small as possible. In so doing, one of ordinary skill would be motivated to retain a certain minimum size based on the minimum sizes of available probes and bond-wires, to thus arrive at any probing pad size and any bonding pad size, wherein a probe can make electrical contact and a bonding wire can be attached, respectively.

Kim et al. do not specifically disclose that the uppermost wiring layer is patterned by "a lithography method." Yet, the examiner takes Official Notice that creating a conductive pattern of a wafer by a lithography method has been notoriously well known for decades and is advantageous for creating a large amount of pattern in a single exposure step. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to adopt a lithography method to pattern layer 56 in Kim et al., motivated to create many patterns simultaneously as is notoriously well known in the art.

7. Claims 36-39, 43-44, 46, and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al., as applied to claim 31 above, and further in view of Marcus et al. (U.S. 5,475,318) taken with Sugawara (U.S. 5,936,876).

Regarding claims 36-39, 46 and 48, Kim et al. is silent about a particular radius of curvature of probe 60 depicted contacting a 1st electrode pad in the scribe region.

Marcus et al. disclose microprobes (abstract) suitable for wafer probing (col. 7). These probes are so small that one of ordinary skill would be motivated to make probing pads on the chip very small on the order of the probe. As taught by Sugawara, the size of probing pads is not critical, but can be made much smaller than wire bonding pads (brief summary text 16).

Furthermore, one of ordinary skill in the art would be motivated to make smaller and smaller probe pads and bond pads to increase silicon real estate [abstract], but would be motivated to place a lower bound on size on each of the probing pad and bond pad, based on the probe size and bond wire size, respectively.

Regarding claims 44 and 49, Sugawara discloses the techniques of selective etching or FIB to expose the probing pads from underneath the protection layer [col. 7]. It would have been obvious to one of ordinary skill in the art to selectively remove the protection layer of the pads using FIB or selective etch, motivated to make electrical contact with the pad(s) as disclosed by Sugawara.

Regarding claim 43, the pads are in a "island shape" (i.e. a rectangular island shape).

Regarding claims 45 and 47, it would have been obvious to include an additional pad in the scribe line common to a plurality of TEGs for the purposes of providing a common ground or a supply rail, for example, as is known in the art when testing at the wafer level.

Regarding claims 41 and 42, the references are silent about an overlap size of a pad as compared to the diameter of the connect hole via, a concept known in the art as "framing" the via. Again, the courts have ruled that limitations of size do not distinguish from the prior art unless an unexpected result is attained. It would have been obvious to one of ordinary skill in the art to size the pad larger than the via to assure a good electrical path from the via to the pad, in view of the well known concepts of misregistration and contact resistance.

Allowable Subject Matter

8. Claim 50 would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action.

9. Claims 51-53 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose the claimed method wherein a particular combination of extraction electrode pads in a scribe region and product region are

provided and pads in the scribe region measured by contacting a probe with rounded tip wherein logic circuits are provided as TEG elements probed in the scribe region.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 703-306-5689. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.

ETP
November 3, 2003


EVAN PERT
PRIMARY EXAMINER